

Gunter, Jason

From: Nations, Mark [mnations@doerun.com]
Sent: Wednesday, June 12, 2013 6:11 PM
To: Gunter, Jason; England, Jason; Yingling, Mark; Wohl, Matthew; robert.hinkson@dnr.mo.gov; Ty Morris (TMorris@barr.com)
Subject: Leadwood Progress Report
Attachments: LW 05-13.doc; Leadwood Water Samples_05-23-13.pdf

Jason,
Attached is the May report.
Mark

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0402



Remediation Group

Mark Nations
Mining Properties Manager
mnations@doerun.com

June 12, 2013

Mr. Jason Gunter
Remedial Project Manager
U.S. Environmental Protection Agency
Region 7 - Superfund Branch
11201 Renner Blvd.
Lenexa, KS 66219

Re: The Doe Run Company - Leadwood Mine Tailings Site Monthly Progress Report

Dear Mr. Gunter:

As required by Article VI, Section 50 of the Unilateral Administrative Order (Docket No. CERCLA-07-2006-0272) for the referenced project and on behalf of The Doe Run Company, the progress report for the period May 1, 2013 through May 31, 2013 is enclosed. If you have any questions or comments, please call me at 573-518-0800.

Sincerely,

A handwritten signature in black ink that reads "Mark Nations".

Mark Nations
Mining Properties Manager

Enclosures

c: Jason England – TDRC
Mark Yingling – TDRC (electronic only)
Matt Wohl – TDRC (electronic only)
Robert Hinkson – MDNR
Ty Morris – Barr Engineering

Leadwood Mine Tailings Site
Leadwood, Missouri
Removal Action - Monthly Progress Report
Period: May 1, 2013 – May 31, 2013

1. Actions Performed or Completed This Period:

- a. No activities were completed at the site during this period.

2. Data and Results Received This Period:

- a. During this period, water samples were collected from downstream of Leadwood Dam and the East Seep and Erosion Area, as well as from upstream and downstream of the confluence of Eaton Creek with Big River. The analytical results for this event are included with this progress report.

3. Scheduled Activities not Completed This Period:

- a. None.

4. Planned Activities for Next Period:

- a. Continue vegetation maintenance activities. The use of biosolids will only be continued if a biosolids management plan has been submitted to and approved by EPA.
- b. It is anticipated that EPA will use this site as a soil repository in the future. Preparations for these activities will continue.
- c. Complete monthly water sampling activities as described in the Removal Action Work Plan.
- d. Complete air monitoring activities as described in the Removal Action Work Plan.

5. Changes in Personnel:

- a. None.

6. Issues or Problems Arising This Period:

- a. None.

7. Resolution of Issues or Problems Arising This Period:

- a. None.

End of Monthly Progress Report

May 31, 2013

Allison Olds
Barr Engineering Company
1001 Diamond Ridge
Suite 1100
Jefferson City, MO 65109
TEL: (573) 638-5007
FAX: (573) 638-5001



RE: Leadwood Mine Tailings Site NPDES

WorkOrder: 13051285

Dear Allison Olds:

TEKLAB, INC received 5 samples on 5/24/2013 7:45:00 AM for the analysis presented in the following report.

Samples are analyzed on an as received basis unless otherwise requested and documented. The sample results contained in this report relate only to the requested analytes of interest as directed on the chain of custody. NELAP accredited fields of testing are indicated by the letters NELAP under the Certification column. Unless otherwise documented within this report, Teklab Inc. analyzes samples utilizing the most current methods in compliance with 40CFR. All tests are performed in the Collinsville, IL laboratory unless otherwise noted in the Case Narrative.

All quality control criteria applicable to the test methods employed for this project have been satisfactorily met and are in accordance with NELAP except where noted. The following report shall not be reproduced, except in full, without the written approval of Teklab, Inc.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,



Michael L. Austin
Project Manager
(618)344-1004 ex 16
MAustin@teklabinc.com



Report Contents

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 13051285

Client Project: Leadwood Mine Tailings Site NPDES

Report Date: 31-May-13

This reporting package includes the following:

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Definitions

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 13051285

Client Project: Leadwood Mine Tailings Site NPDES

Report Date: 31-May-13

Abbr Definition

CCV Continuing calibration verification is a check of a standard to determine the state of calibration of an instrument between recalibration.

DF Dilution factor is the dilution performed during analysis only and does not take into account any dilutions made during sample preparation. The reported result is final and includes all dilutions factors.

DNI Did not ignite

DUP Laboratory duplicate is an aliquot of a sample taken from the same container under laboratory conditions for independent processing and analysis independently of the original aliquot.

ICV Initial calibration verification is a check of a standard to determine the state of calibration of an instrument before sample analysis is initiated.

IDPH IL Dept. of Public Health

LCS Laboratory control sample, spiked with verified known amounts of analytes, is analyzed exactly like a sample to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system. The acceptable recovery range is in the QC Package (provided upon request).

LCSD Laboratory control sample duplicate is a replicate laboratory control sample that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).

MB Method blank is a sample of a matrix similar to the batch of associated sample (when available) that is free from the analytes of interest and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedures, and in which no target analytes or interferences should present at concentrations that impact the analytical results for sample analyses.

MDL Method detection limit means the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.

MS Matrix spike is an aliquot of matrix fortified (spiked) with known quantities of specific analytes that is subjected to the entire analytical procedures in order to determine the effect of the matrix on an approved test method's recovery system. The acceptable recovery range is listed in the QC Package (provided upon request).

MSD Matrix spike duplicate means a replicate matrix spike that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).

MW Molecular weight

ND Not Detected at the Reporting Limit

NELAP NELAP Accredited

PQL Practical quantitation limit means the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operation conditions. The acceptable recovery range is listed in the QC Package (provided upon request).

RL The reporting limit the lowest level that the data is displayed in the final report. The reporting limit may vary according to customer request or sample dilution. The reporting limit may not be less than the MDL.

RPD Relative percent difference is a calculated difference between two recoveries (ie. MS/MSD). The acceptable recovery limit is listed in the QC Package (provided upon request).

SPK The spike is a known mass of target analyte added to a blank sample or sub-sample; used to determine recovery deficiency or for other quality control purposes.

Surrogate Surrogates are compounds which are similar to the analytes of interest in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples.

TNTC Too numerous to count (> 200 CFU)

Qualifiers

- Unknown hydrocarbon

B - Analyte detected in associated Method Blank

E - Value above quantitation range

H - Holding times exceeded

M - Manual Integration used to determine area response

ND - Not Detected at the Reporting Limit

R - RPD outside accepted recovery limits

S - Spike Recovery outside recovery limits

X - Value exceeds Maximum Contaminant Level



Case Narrative

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 13051285

Client Project: Leadwood Mine Tailings Site NPDES

Report Date: 31-May-13

Cooler Receipt Temp: 1.8 °C

Locations and Accreditations

Collinsville		Springfield		Kansas City	
Address	5445 Horseshoe Lake Road Collinsville, IL 62234-7425	Address	3920 Pintail Dr Springfield, IL 62711-9415	Address	8421 Nieman Road Lenexa, KS 66214
Phone	(618) 344-1004	Phone	(217) 698-1004	Phone	(913) 541-1998
Fax	(618) 344-1005	Fax	(217) 698-1005	Fax	(913) 541-1998
Email	jhriley@teklabinc.com	Email	KKlostermann@teklabinc.com	Email	dthompson@teklabinc.com

State	Dept	Cert #	NELAP	Exp Date	Lab
Illinois	IEPA	100226	NELAP	1/31/2014	Collinsville
Kansas	KDHE	E-10374	NELAP	1/31/2014	Collinsville
Louisiana	LDEQ	166493	NELAP	6/30/2013	Collinsville
Louisiana	LDEQ	166578	NELAP	6/30/2013	Springfield
Texas	TCEQ	T104704515-12-1	NELAP	7/31/2013	Collinsville
Arkansas	ADEQ	88-0966		3/14/2014	Collinsville
Illinois	IDPH	17584		4/30/2013	Collinsville
Kentucky	UST	0073		4/5/2014	Collinsville
Missouri	MDNR	00930		4/13/2013	Collinsville
Oklahoma	ODEQ	9978		8/31/2013	Collinsville



Laboratory Results

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 13051285

Client Project: Leadwood Mine Tailings Site NPDES

Report Date: 31-May-13

Lab ID: 13051285-001

Client Sample ID: LW-001

Matrix: SURFACE WATER

Collection Date: 05/23/2013 9:20

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993 (TOTAL)								
Sulfate	NELAP	100		184	mg/L	10	05/24/2013 18:38	R177547
STANDARD METHOD 4500-H B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		8.13		1	05/28/2013 13:00	R177579
STANDARD METHODS 2540 D								
Total Suspended Solids	NELAP	6		< 6	mg/L	1	05/24/2013 17:58	R177519
STANDARD METHODS 2540 F								
Solids, Settleable	NELAP	0.1		< 0.1	ml/L	1	05/24/2013 10:32	R177513
STANDARD METHODS 5310 C, ORGANIC CARBON								
Total Organic Carbon (TOC)	NELAP	1.0		4.6	mg/L	1	05/24/2013 15:44	R177518
EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)								
Cadmium	NELAP	2.00		< 2.00	µg/L	1	05/24/2013 15:22	88585
Zinc	NELAP	10.0		1110	µg/L	1	05/24/2013 15:22	88585
EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)								
Cadmium	NELAP	2.00		< 2.00	µg/L	1	05/28/2013 16:21	88580
Zinc	NELAP	10.0		937	µg/L	1	05/28/2013 16:21	88580
STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA								
Lead	NELAP	2.00	X	5.16	µg/L	1	05/28/2013 9:20	88579
STANDARD METHODS 2340 B, HARDNESS (TOTAL)								
Hardness, as (CaCO ₃)	NELAP	1		334	mg/L	1	05/28/2013 0:00	R177566
STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)								
Lead	NELAP	2.00		3.96	µg/L	1	05/24/2013 12:27	88584



Laboratory Results

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 13051285

Client Project: Leadwood Mine Tailings Site NPDES

Report Date: 31-May-13

Lab ID: 13051285-002

Client Sample ID: LW-002

Matrix: SURFACE WATER

Collection Date: 05/23/2013 8:10

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993 (TOTAL)								
Sulfate	NELAP	500	S	581	mg/L	50	05/24/2013 18:54	R177547
MS and/or MSD did not recover within control limits due to matrix interference.								
STANDARD METHOD 4500-H B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		7.97		1	05/28/2013 13:03	R177579
STANDARD METHODS 2540 D								
Total Suspended Solids	NELAP	6		6	mg/L	1	05/24/2013 17:58	R177519
STANDARD METHODS 2540 F								
Solids, Settleable	NELAP	0.1		< 0.1	ml/L	1	05/24/2013 10:32	R177513
STANDARD METHODS 5310 C, ORGANIC CARBON								
Total Organic Carbon (TOC)	NELAP	1.0		4.1	mg/L	1	05/24/2013 15:50	R177518
EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)								
Cadmium	NELAP	2.00		2.30	µg/L	1	05/24/2013 15:26	88585
Zinc	NELAP	10.0	S	3700	µg/L	1	05/24/2013 15:26	88585
MS QC limit for Zn are not applicable due to high sample/spike ratio.								
EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)								
Cadmium	NELAP	2.00		3.00	µg/L	1	05/28/2013 16:25	88580
Zinc	NELAP	10.0	S	3850	µg/L	1	05/28/2013 16:25	88580
MS QC limits for Ca, Mg and Zn are not applicable due to high sample/spike ratio.								
STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA								
Lead	NELAP	2.00	X	9.37	µg/L	1	05/28/2013 9:30	88579
STANDARD METHODS 2340 B, HARDNESS (TOTAL)								
Hardness, as (CaCO ₃)	NELAP	1		562	mg/L	1	05/28/2013 0:00	R177566
STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)								
Lead	NELAP	2.00	X	6.79	µg/L	1	05/24/2013 12:38	88584



Laboratory Results

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 13051285

Client Project: Leadwood Mine Tailings Site NPDES

Report Date: 31-May-13

Lab ID: 13051285-003

Client Sample ID: LW-US

Matrix: SURFACE WATER

Collection Date: 05/23/2013 9:10

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993 (TOTAL)								
Sulfate	NELAP	10		20	mg/L	1	05/24/2013 19:18	R177547
STANDARD METHOD 4500-H B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		7.94		1	05/28/2013 13:06	R177579
STANDARD METHODS 2540 D								
Total Suspended Solids	NELAP	6		< 6	mg/L	1	05/24/2013 17:58	R177519
STANDARD METHODS 5310 C, ORGANIC CARBON								
Total Organic Carbon (TOC)	NELAP	1.0		1.7	mg/L	1	05/24/2013 15:56	R177518
EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)								
Cadmium	NELAP	2.00		< 2.00	µg/L	1	05/24/2013 15:37	88585
Zinc	NELAP	10.0		< 10.0	µg/L	1	05/24/2013 15:37	88585
EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)								
Cadmium	NELAP	2.00		< 2.00	µg/L	1	05/28/2013 16:36	88580
Zinc	NELAP	10.0		< 10.0	µg/L	1	05/28/2013 16:36	88580
STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA								
Lead	NELAP	2.00		< 2.00	µg/L	1	05/28/2013 9:34	88579
STANDARD METHODS 2340 B, HARDNESS (TOTAL)								
Hardness, as (CaCO ₃)	NELAP	1		179	mg/L	1	05/28/2013 0:00	R177566
STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)								
Lead	NELAP	2.00		< 2.00	µg/L	1	05/24/2013 12:41	88584



Laboratory Results

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 13051285

Client Project: Leadwood Mine Tailings Site NPDES

Report Date: 31-May-13

Lab ID: 13051285-004

Client Sample ID: LW-DS

Matrix: SURFACE WATER

Collection Date: 05/23/2013 8:45

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993 (TOTAL)								
Sulfate	NELAP	10		25	mg/L	1	05/24/2013 19:24	R177547
STANDARD METHOD 4500-H B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		7.90		1	05/28/2013 13:10	R177579
STANDARD METHODS 2540 D								
Total Suspended Solids	NELAP	6		7	mg/L	1	05/24/2013 18:06	R177519
STANDARD METHODS 5310 C, ORGANIC CARBON								
Total Organic Carbon (TOC)	NELAP	1.0		2.0	mg/L	1	05/24/2013 16:22	R177518
EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)								
Cadmium	NELAP	2.00		< 2.00	µg/L	1	05/24/2013 15:41	88585
Zinc	NELAP	10.0		41.2	µg/L	1	05/24/2013 15:41	88585
EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)								
Cadmium	NELAP	2.00		< 2.00	µg/L	1	05/28/2013 16:40	88580
Zinc	NELAP	10.0		42.5	µg/L	1	05/28/2013 16:40	88580
STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA								
Lead	NELAP	2.00		< 2.00	µg/L	1	05/28/2013 9:37	88579
STANDARD METHODS 2340 B, HARDNESS (TOTAL)								
Hardness, as (CaCO ₃)	NELAP	1		188	mg/L	1	05/28/2013 0:00	R177566
STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)								
Lead	NELAP	2.00		< 2.00	µg/L	1	05/24/2013 12:44	88584



Laboratory Results

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 13051285

Client Project: Leadwood Mine Tailings Site NPDES

Report Date: 31-May-13

Lab ID: 13051285-005

Client Sample ID: LW-DUP

Matrix: SURFACE WATER

Collection Date: 05/23/2013 0:00

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993 (TOTAL)								
Sulfate	NELAP	200		523	mg/L	20	05/24/2013 19:34	R177547
STANDARD METHOD 4500-H B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		7.93		1	05/28/2013 13:15	R177579
STANDARD METHODS 2540 D								
Total Suspended Solids	NELAP	6		6	mg/L	1	05/24/2013 18:06	R177519
STANDARD METHODS 2540 F								
Solids, Settleable	NELAP	0.1		< 0.1	ml/L	1	05/24/2013 10:32	R177513
STANDARD METHODS 5310 C, ORGANIC CARBON								
Total Organic Carbon (TOC)	NELAP	1.0		4.2	mg/L	1	05/24/2013 16:28	R177518
EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)								
Cadmium	NELAP	2.00		2.30	µg/L	1	05/24/2013 15:52	88585
Zinc	NELAP	10.0		3710	µg/L	1	05/24/2013 15:52	88585
EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)								
Cadmium	NELAP	2.00		2.90	µg/L	1	05/28/2013 16:43	88580
Zinc	NELAP	10.0		3720	µg/L	1	05/28/2013 16:43	88580
STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA								
Lead	NELAP	2.00	X	10.3	µg/L	1	05/28/2013 9:40	88579
STANDARD METHODS 2340 B, HARDNESS (TOTAL)								
Hardness, as (CaCO ₃)	NELAP	1		546	mg/L	1	05/28/2013 0:00	R177566
STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)								
Lead	NELAP	2.00	X	6.86	µg/L	1	05/24/2013 12:48	88584



Sample Summary

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 13051285

Client Project: Leadwood Mine Tailings Site NPDES

Report Date: 31-May-13

Lab Sample ID	Client Sample ID	Matrix	Fractions	Collection Date
13051285-001	LW-001	Surface Water	5	05/23/2013 9:20
13051285-002	LW-002	Surface Water	5	05/23/2013 8:10
13051285-003	LW-US	Surface Water	5	05/23/2013 9:10
13051285-004	LW-DS	Surface Water	5	05/23/2013 8:45
13051285-005	LW-DUP	Surface Water	5	05/23/2013 0:00



Dates Report

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 13051285

Client Project: Leadwood Mine Tailings Site NPDES

Report Date: 31-May-13

Sample ID	Client Sample ID	Collection Date	Received Date	Prep Date/Time	Analysis Date/Time
	Test Name				
13051285-001A	LW-001	05/23/2013 9:20	05/24/2013 8:38		
	Standard Methods 2540 F				05/24/2013 10:32
13051285-001B	LW-001	05/23/2013 9:20	05/24/2013 8:38		
	EPA 600 375.2 Rev 2.0 1993 (Total)				05/24/2013 18:38
	Standard Method 4500-H B, Laboratory Analyzed				05/28/2013 13:00
	Standard Methods 2540 D				05/24/2013 17:58
13051285-001C	LW-001	05/23/2013 9:20	05/24/2013 8:38		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			05/24/2013 9:52	05/28/2013 16:21
	Standard Methods 3030 E, 3113 B, Metals by GFAA			05/24/2013 9:33	05/28/2013 9:20
	Standard Methods 2340 B, Hardness (Total)				05/28/2013 0:00
13051285-001D	LW-001	05/23/2013 9:20	05/24/2013 8:38		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			05/24/2013 10:43	05/24/2013 15:22
	Standard Methods 3030 B, 3113 B, Metals by GFAA (Dissolved)			05/24/2013 10:17	05/24/2013 12:27
13051285-001E	LW-001	05/23/2013 9:20	05/24/2013 8:38		
	Standard Methods 5310 C, Organic Carbon				05/24/2013 15:44
13051285-002A	LW-002	05/23/2013 8:10	05/24/2013 8:38		
	Standard Methods 2540 F				05/24/2013 10:32
13051285-002B	LW-002	05/23/2013 8:10	05/24/2013 8:38		
	EPA 600 375.2 Rev 2.0 1993 (Total)				05/24/2013 18:54
	Standard Method 4500-H B, Laboratory Analyzed				05/28/2013 13:03
	Standard Methods 2540 D				05/24/2013 17:58
13051285-002C	LW-002	05/23/2013 8:10	05/24/2013 8:38		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			05/24/2013 9:52	05/28/2013 16:25
	Standard Methods 3030 E, 3113 B, Metals by GFAA			05/24/2013 9:33	05/28/2013 9:30
	Standard Methods 2340 B, Hardness (Total)				05/28/2013 0:00
13051285-002D	LW-002	05/23/2013 8:10	05/24/2013 8:38		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			05/24/2013 10:43	05/24/2013 15:26
	Standard Methods 3030 B, 3113 B, Metals by GFAA (Dissolved)			05/24/2013 10:17	05/24/2013 12:38
13051285-002E	LW-002	05/23/2013 8:10	05/24/2013 8:38		
	Standard Methods 5310 C, Organic Carbon				05/24/2013 15:50
13051285-003A	LW-US	05/23/2013 9:10	05/24/2013 8:38		
	Standard Methods 2540 D				05/24/2013 17:58
13051285-003B	LW-US	05/23/2013 9:10	05/24/2013 8:38		
	EPA 600 375.2 Rev 2.0 1993 (Total)				05/24/2013 19:18
	Standard Method 4500-H B, Laboratory Analyzed				05/28/2013 13:06
13051285-003C	LW-US	05/23/2013 9:10	05/24/2013 8:38		



Dates Report

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 13051285

Client Project: Leadwood Mine Tailings Site NPDES

Report Date: 31-May-13

Sample ID	Client Sample ID	Collection Date	Received Date	Prep Date/Time	Analysis Date/Time
Test Name					
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			05/24/2013 9:52	05/28/2013 16:36
	Standard Methods 3030 E, 3113 B, Metals by GFAA			05/24/2013 9:33	05/28/2013 9:34
	Standard Methods 2340 B, Hardness (Total)				05/28/2013 0:00
13051285-003D	LW-US	05/23/2013 9:10	05/24/2013 8:38		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			05/24/2013 10:43	05/24/2013 15:37
	Standard Methods 3030 B, 3113 B, Metals by GFAA (Dissolved)			05/24/2013 10:17	05/24/2013 12:41
13051285-003E	LW-US	05/23/2013 9:10	05/24/2013 8:38		
	Standard Methods 5310 C, Organic Carbon				05/24/2013 15:56
13051285-004A	LW-DS	05/23/2013 8:45	05/24/2013 8:38		
	Standard Methods 2540 D				05/24/2013 18:06
13051285-004B	LW-DS	05/23/2013 8:45	05/24/2013 8:38		
	EPA 600 375.2 Rev 2.0 1993 (Total)				05/24/2013 19:24
	Standard Method 4500-H B, Laboratory Analyzed				05/28/2013 13:10
13051285-004C	LW-DS	05/23/2013 8:45	05/24/2013 8:38		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			05/24/2013 9:52	05/28/2013 16:40
	Standard Methods 3030 E, 3113 B, Metals by GFAA			05/24/2013 9:33	05/28/2013 9:37
	Standard Methods 2340 B, Hardness (Total)				05/28/2013 0:00
13051285-004D	LW-DS	05/23/2013 8:45	05/24/2013 8:38		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			05/24/2013 10:43	05/24/2013 15:41
	Standard Methods 3030 B, 3113 B, Metals by GFAA (Dissolved)			05/24/2013 10:17	05/24/2013 12:44
13051285-004E	LW-DS	05/23/2013 8:45	05/24/2013 8:38		
	Standard Methods 5310 C, Organic Carbon				05/24/2013 16:22
13051285-005A	LW-DUP	05/23/2013 0:00	05/24/2013 8:38		
	Standard Methods 2540 F				05/24/2013 10:32
13051285-005B	LW-DUP	05/23/2013 0:00	05/24/2013 8:38		
	EPA 600 375.2 Rev 2.0 1993 (Total)				05/24/2013 19:34
	Standard Method 4500-H B, Laboratory Analyzed				05/28/2013 13:15
	Standard Methods 2540 D				05/24/2013 18:06
13051285-005C	LW-DUP	05/23/2013 0:00	05/24/2013 8:38		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			05/24/2013 9:52	05/28/2013 16:43
	Standard Methods 3030 E, 3113 B, Metals by GFAA			05/24/2013 9:33	05/28/2013 9:40
	Standard Methods 2340 B, Hardness (Total)				05/28/2013 0:00
13051285-005D	LW-DUP	05/23/2013 0:00	05/24/2013 8:38		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			05/24/2013 10:43	05/24/2013 15:52
	Standard Methods 3030 B, 3113 B, Metals by GFAA (Dissolved)			05/24/2013 10:17	05/24/2013 12:48
13051285-005E	LW-DUP	05/23/2013 0:00	05/24/2013 8:38		



Dates Report

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Client Project: Leadwood Mine Tailings Site NPDES

Work Order: 13051285

Report Date: 31-May-13

Sample ID	Client Sample ID	Collection Date	Received Date	Prep Date/Time	Analysis Date/Time
Test Name					
	Standard Methods 5310 C, Organic Carbon				



Quality Control Results

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 13051285

Client Project: Leadwood Mine Tailings Site NPDES

Report Date: 31-May-13

EPA 600 375.2 REV 2.0 1993 (TOTAL)

Batch R177547	SampType: MBLK	Units mg/L							
SamplD: MBLK									
Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10		< 10						05/24/2013

Batch R177547	SampType: LCS	Units mg/L							
SamplD: LCS									
Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10		21	20	0	105.8	90	110	05/24/2013

Batch R177547	SampType: MS	Units mg/L							
SamplD: 13051285-002BMS									
Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	500	S	1010	500	580.7	84.9	90	110	05/24/2013

Batch R177547	SampType: MSD	Units mg/L							
SamplD: 13051285-002BMSD									
Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Sulfate	500		1040	500	580.7	91.3	1005	3.17	05/24/2013

STANDARD METHOD 4500-H B, LABORATORY ANALYZED

Batch R177579	SampType: LCS	Units							
SamplD: LCS									
Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lab pH	1.00		6.97	7.00	0	99.6	99.1	100.8	05/28/2013

Batch R177579	SampType: DUP	Units							
SamplD: 13051285-001B									
Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH	1.00		8.14				8.130	0.12	05/28/2013

Batch R177579	SampType: DUP	Units							
SamplD: 13051285-002B									
Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH	1.00		7.97				7.970	0.00	05/28/2013

Batch R177579	SampType: DUP	Units							
SamplD: 13051285-003B									
Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH	1.00		7.94				7.940	0.00	05/28/2013



Quality Control Results

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 13051285

Client Project: Leadwood Mine Tailings Site NPDES

Report Date: 31-May-13

STANDARD METHOD 4500-H B, LABORATORY ANALYZED

Batch	R177579	SampType:	DUP	Units	RPD Limit 10				
SamplID: 13051285-004B									
Analyses		RL	Qual		Result	Spike	SPK Ref Val	%REC	RPD Ref Val %RPD
Lab pH		1.00			7.93				7.900 0.38

Batch	R177579	SampType:	DUP	Units	RPD Limit 10				
SamplID: 13051285-005B									
Analyses		RL	Qual		Result	Spike	SPK Ref Val	%REC	RPD Ref Val %RPD
Lab pH		1.00			7.94				7.930 0.13

STANDARD METHODS 2540 D

Batch	R177519	SampType:	MBLK	Units mg/L					
SamplID: MBLK									
Analyses		RL	Qual		Result	Spike	SPK Ref Val	%REC	Low Limit High Limit
Total Suspended Solids		6			< 6				05/24/2013

Batch	R177519	SampType:	LCS	Units mg/L					
SamplID: LCS									
Analyses		RL	Qual		Result	Spike	SPK Ref Val	%REC	Low Limit High Limit
Total Suspended Solids		6			93	100	0	93.0	85 115
Total Suspended Solids		6			96	100	0	96.0	85 115
Total Suspended Solids		6			104	100	0	104.0	85 115
Total Suspended Solids		6			105	100	0	105.0	85 115

Batch	R177519	SampType:	DUP	Units mg/L	RPD Limit 15				
SamplID: 13051285-003A-DUP									
Analyses		RL	Qual		Result	Spike	SPK Ref Val	%REC	RPD Ref Val %RPD
Total Suspended Solids		6			< 6				0 0.00

Batch	R177518	SampType:	MBLK	Units mg/L					
SamplID: ICB/MBLK									
Analyses		RL	Qual		Result	Spike	SPK Ref Val	%REC	Low Limit High Limit
Total Organic Carbon (TOC)		1.0			< 1.0				05/24/2013

Batch	R177518	SampType:	LCS	Units mg/L					
SamplID: ICV/LCS									
Analyses		RL	Qual		Result	Spike	SPK Ref Val	%REC	Low Limit High Limit
Total Organic Carbon (TOC)		10.0			44.4	43.6	0	101.8	90 110

Batch	R177518	SampType:	MS	Units mg/L					
SamplID: 13051285-003EMS									
Analyses		RL	Qual		Result	Spike	SPK Ref Val	%REC	Low Limit High Limit
Total Organic Carbon (TOC)		1.0			6.7	5.0	1.670	100.8	85 115



Quality Control Results

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 13051285

Client Project: Leadwood Mine Tailings Site NPDES

Report Date: 31-May-13

STANDARD METHODS 5310 C, ORGANIC CARBON

Batch	R177518	SampType:	MSD	Units	mg/L				RPD Limit	10	Date	
Analyses				RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Analyzed
Total Organic Carbon (TOC)				1.0		6.8	5.0	1.670	102.6	6.710	1.33	05/24/2013

EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)

Batch	88585	SampType:	MBLK	Units	µg/L				Low Limit	High Limit	Date	
Analyses				RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Cadmium				2.00		< 2.00	2.00	0	0	-100	100	05/24/2013
Zinc				10.0		< 10.0	10.0	0	23.0	-100	100	05/24/2013

Batch 88585 SampType: LCS

Batch	88585	SampType:	LCS	Units	µg/L				Low Limit	High Limit	Date	
Analyses				RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Cadmium				2.00		45.2	50.0	0	90.4	85	115	05/24/2013
Zinc				10.0		446	500	0	89.1	85	115	05/24/2013

Batch 88585 SampType: MS

Batch	88585	SampType:	MS	Units	µg/L				Low Limit	High Limit	Date	
Analyses				RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Cadmium				2.00		47.0	50.0	2.3	89.4	75	125	05/24/2013
Zinc				10.0		4090	500	3702	78.4	75	125	05/24/2013

Batch 88585 SampType: MSD

Batch	88585	SampType:	MSD	Units	µg/L				RPD Limit	20	Date	
Analyses				RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Analyzed
Cadmium				2.00		47.2	50.0	2.3	89.8	47	0.42	05/24/2013
Zinc				10.0	S	4070	500	3702	73.4	4094	0.61	05/24/2013

EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)

Batch	88580	SampType:	MBLK	Units	µg/L				Low Limit	High Limit	Date	
Analyses				RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Cadmium				2.00		< 2.00	2.00	0	0	-100	100	05/28/2013
Calcium				50.0		< 50.0	50.0	0	0	-100	100	05/28/2013
Magnesium				10.0		< 10.0	10.0	0	0	-100	100	05/28/2013
Zinc				10.0		< 10.0	10.0	0	30.0	-100	100	05/28/2013



Quality Control Results

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 13051285

Client Project: Leadwood Mine Tailings Site NPDES

Report Date: 31-May-13

EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)

Batch	88580	SampType:	LCS	Units	µg/L						
SamplID: LCS-88580											
Analyses		RL	Qual	Result	Spike	SPK	Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium		2.00		48.4	50.0	0	96.8		85	115	05/28/2013
Calcium		50.0		1300	1200	0	108.2		85	115	05/28/2013
Magnesium		10.0		762	750	0	101.6		85	115	05/28/2013
Zinc		10.0		464	500	0	92.8		85	115	05/28/2013

Batch 88580 SampType: MS Units µg/L

Batch	88580	SampType:	MS	Units	µg/L						
SamplID: 13051285-002CMS											
Analyses		RL	Qual	Result	Spike	SPK	Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium		2.00		49.8	50.0	3	93.6		75	125	05/28/2013
Calcium		50.0	S	154000	1200	154800	-100.0		75	125	05/28/2013
Magnesium		10.0	S	42300	750	42680	-45.3		75	125	05/28/2013
Zinc		10.0	S	4210	500	3850	72.8		75	125	05/28/2013

Batch 88580 SampType: MSD Units µg/L RPD Limit 20

Batch	88580	SampType:	MSD	Units	µg/L						
SamplID: 13051285-002CMSD											RPD Limit 20
Analyses		RL	Qual	Result	Spike	SPK	Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Cadmium		2.00		49.6	50.0	3	93.2		49.8	0.40	05/28/2013
Calcium		50.0	S	154000	1200	154800	-75.0		153600	0.20	05/28/2013
Magnesium		10.0	S	42000	750	42680	-88.0		42340	0.76	05/28/2013
Zinc		10.0	S	4180	500	3850	66.0		4214	0.81	05/28/2013

STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA

Batch	88579	SampType:	MBLK	Units	µg/L						
SamplID: MBLK-88579											
Analyses		RL	Qual	Result	Spike	SPK	Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead		2.00		< 2.00	2.00	0	0		-100	100	05/28/2013

Batch 88579 SampType: LCS Units µg/L

Batch	88579	SampType:	LCS	Units	µg/L						
SamplID: LCS-88579											
Analyses		RL	Qual	Result	Spike	SPK	Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead		4.00		12.8	15.0	0	85.6		85	115	05/28/2013

Batch 88579 SampType: MS Units µg/L

Batch	88579	SampType:	MS	Units	µg/L						
SamplID: 13051285-001CMS											RPD Limit 20
Analyses		RL	Qual	Result	Spike	SPK	Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead		2.00		20.6	15.0	5.1586	102.7		70	130	05/28/2013

Batch 88579 SampType: MSD Units µg/L RPD Limit 20

Batch	88579	SampType:	MSD	Units	µg/L						
SamplID: 13051285-001CMSD											RPD Limit 20
Analyses		RL	Qual	Result	Spike	SPK	Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lead		2.00		20.6	15.0	5.1586	103.2		20.5585	0.39	05/28/2013



Quality Control Results

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 13051285

Client Project: Leadwood Mine Tailings Site NPDES

Report Date: 31-May-13

STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)

Batch	88584	SampType:	MBLK	Units	µg/L						Date
SampID: MBLK-88584											
Analyses											
Lead		RL	Qual	Result	Spike	SPK	Ref Val	%REC	Low Limit	High Limit	

Batch	88584	SampType:	LCS	Units	µg/L						Date
SampID: LCS-88584											
Analyses											
Lead		RL	Qual	Result	Spike	SPK	Ref Val	%REC	Low Limit	High Limit	

Batch	88584	SampType:	MS	Units	µg/L						Date
SampID: 13051285-001DMS											
Analyses											
Lead		RL	Qual	Result	Spike	SPK	Ref Val	%REC	Low Limit	High Limit	

Batch	88584	SampType:	MSD	Units	µg/L						RPD Limit 20
SampID: 13051285-001DMSD											
Analyses											
Lead		RL	Qual	Result	Spike	SPK	Ref Val	%REC	RPD Ref Val	%RPD	



Receiving Check List

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 13051285

Client Project: Leadwood Mine Tailings Site NPDES

Report Date: 31-May-13

Carrier: Timothy Mathis

Received By: SRH

Completed by:

On:

24-May-13

Timothy W. Mathis

Reviewed by:

On:

24-May-13

Michael L. Austin

Pages to follow: Chain of custody

1

Extra pages included

0

Shipping container/cooler in good condition?

Yes

No

Not Present

Temp °C **1.8**

Type of thermal preservation?

None

Ice

Blue Ice

Dry Ice

Chain of custody present?

Yes

No

Chain of custody signed when relinquished and received?

Yes

No

Chain of custody agrees with sample labels?

Yes

No

Samples in proper container/bottle?

Yes

No

Sample containers intact?

Yes

No

Sufficient sample volume for indicated test?

Yes

No

All samples received within holding time?

Yes

No

Reported field parameters measured:

Field

Lab

NA

Container/Temp Blank temperature in compliance?

Yes

No

When thermal preservation is required, samples are compliant with a temperature between 0.1°C - 6.0°C, or when samples are received on ice the same day as collected.

Water – at least one vial per sample has zero headspace?

Yes

No

No VOA vials

Water - TOX containers have zero headspace?

Yes

No

No TOX containers

Water - pH acceptable upon receipt?

Yes

No

NA

NPDES/CWA TCN interferences checked/treated in the field?

Yes

No

NA

Any No responses must be detailed below or on the COC.

Custody seal(s) intact on shipping container/cooler.



Chain of Custody

1001 Diamond Ridge, Suite 1100
Jefferson City, MO 65109
(573) 638-5000

Project Number: 25860013.00 TLM2 021																									
Project Name: Leadwood Mine Tailing Site NPDES																									
Sample Origination State: MO (use two letter postal state abbreviation)																									
COC Number: LWP 052313																									
Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix		Type		pH	Total Suspended Solids	Sulfate	Settleable Solids	Total Organic Carbon	Total Metals	Dissolved Metals	Hardness	VOCs (tared MeOH) #1	GRO, BTE (tared MeOH) #1	DRO (tared unpreserved)	Metals (unpreserved)	SVOCs (unpreserved) #2	% Solids (plastic vial, unpres.)	Total Number of Containers	COC 1 of 1
						Water	Soil	Grab	Comp																
1. LW-001				05/23/13	09:20	X		X		X X	X X	X X	X X	X X	X X	X X	18051285-001						5	Preservatives: 2 HNO3, 1 H2SO4, 2 Unpreserved	
2. LW-002				05/23/13	08:10	X		X		X X	X X	X X	X X	X X	X X	X X							5	Preservatives: 2 HNO3, 1 H2SO4, 2 Unpreserved	
3. LW-US				05/23/13	09:10	X		X		X X	X X	X X	X X	X X	X X	X X							5	Preservatives: 2 HNO3, 1 H2SO4, 2 Unpreserved	
4. LW-DS				05/23/13	08:45	X		X		X X	X X	X X	X X	X X	X X	X X							5	Preservatives: 2 HNO3, 1 H2SO4, 2 Unpreserved	
5. LW-DUP				05/23/13	--:--	X		X		X X	X X	X X	X X	X X	X X	X X							5	Preservatives: 2 HNO3, 1 H2SO4, 2 Unpreserved	
6.																									
7.																									
8.																									

Comments: Invoice to Mark Nations at Doe Run. Results to be sent to Allison Olds (aolds@barr.com) at Barr Engineering, Andrea Nord (anord@barr.com) at Barr Engineering, and Mark Nations (mnations@doerun.com) at Doe Run.
Matrix is surface water.
Metals include Cadmium, Lead, and Zinc.

Common Parameter/Container – Preservation Key	Relinquished By: <i>Stephen Moilanen</i>	On Ice? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Date: 5/23/13	Time: 16:00	Received by: <i>Stephanie Hayes</i>	Date: 5/24/13	Time: 06:20
#1 – Volatile Organics = BTEX, GRO, TPH, 8260 Full List	Relinquished By: <i>Stephanie Hayes</i>	On Ice? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Date: 5/23/13	Time: 07:45	Received by: <i>Stephanie Hayes</i>	Date: 5/24/13	Time: 7:45
#2 – Semivolatile Organics = PAHs, PCP, Dioxins, 8270 Full List, Herbicide/Pesticide, PCBs	Samples Shipped VIA: <input type="checkbox"/> Air Freight <input type="checkbox"/> Federal Express <input type="checkbox"/> Sampler <input checked="" type="checkbox"/> Other: <i>Courier</i>	Air Bill Number: <i>18051285</i>					

Distribution: White – Original Accompanies Shipment to Lab; Yellow – Field Copy; Pink – Lab Coordinator